

## **A National Field Study for Ground Water Monitoring under the Ground Water Rule**

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One-fourth of all fresh water used in the U.S. and 95% of water used in rural America come from ground water. There are 158,000 public ground water systems in the U.S., and 89 million people are served by community ground water systems. Enteric (intestinal) viruses are important agents of waterborne illness and have been associated with several groundwater outbreaks. Because the detection of microbial pathogens in water is difficult and costly, surrogate microorganisms are typically used as indicators of the presence of pathogens. Traditionally, bacterial indicators such as coliforms and *E. coli* are used worldwide as indicators of water quality and for the detection of fecal contamination. Bacterial indicators, however, are not reliable indicators of viral pathogens. Studies have shown that water sources that met water quality standard were associated with outbreaks due to viruses.

The proposed Ground Water Rule (GWR) seeks to address the issue of risks posed by viruses in ground water by requiring the monitoring of microbial indicators, which will include coliphage, a viral indicator, for the first time in ground water sources serving public water supplies. The GWR seeks to use two EPA methods, 1601 and 1602, to look for coliphage in ground water. The Office of Science and Technology conducted a national field study through a collaborative partnership with geographically representative university laboratories in the states of Texas, New Hampshire, Minnesota, and North Carolina. The study evaluated the effectiveness of EPA methods 1601 and 1602 in detecting coliphages in geographically representative and diverse ground water matrices and further validated and refined the performance characteristics of the methods. This study also compared the detection of coliphages simultaneously with the detection of human enteric viruses.

Not only has EPA science, through coliphage method 1601 and 1602, made an impact on the issue of viral detection in ground water, but the application of the methods has also fostered partnerships with other federal agencies. The methods are now being used as new tools for viral detection in water, biosolids, and in shellfish waters by environmental health laboratories, USGS, NOAA, FDA, FDA, water utilities, states, and academic institutions.